FREEVILLE SITE
EXECUTIVE SUMMARY OF THE
STORMWATER POLLUTION PREVENTION PLAN

Existing Conditions

The land to be developed is located off of NYS Rotue 13 in the Town of Dryden, NY. The existing parcel is 3.6 acres and is currently comprised of an existing building, gravel and paved parking and drive areas, lawn area, and wooded area. A newly formed parcel to be developed within the existing property boundary of this acerage is 1.68 acres.

Water currently drains on this parcel from south to north, away from NYS Route 13 to the back side of the property. The point of study, also known as the low point to which water flows can be found on the back side of the parcel. This point is used for the following stormwater calculations.

The existing drainage area (EDA-1) for the proposed development takes into account the entire existing parcel (3.60 acres) as well as a portion of NYS Route 13, totaling 4 acres. This acreage is broken down into subdrainage areas to determine the appropriate curve number for the overall drainage area. Each landform within the acreage (ie, lawn, pavement, gravel, etc.) has its own curve number. The curve number is calculated to determine how the water will flow over the encountered landform. Please see Table I below for curve number data.

.

Table I
Existing Drainage Area Properties

Drainage Area	Total Area (Acres)	CN	Time of Conc. (hours)
EDA-1	4.00	66	0.192

The time of concentration, or flow path, for the water, starts at NYS Route 13 and travels north to the above mentioned point of study. The first 100 feet of this flow path is considered shallow concentrated flow, or flow that is concentrated into small channels. After the first 100 feet, the remaining flow will turn into sheet flow and is spread out evenly over the land. The time of concentration number is calculated to determine how long it takes a drop of water to flow from the highest elevation on the parcel to the lowest elevation, which will inturn help determine the peak flow rate for each storm frequency. Please see Table I above for time of concentration calculation.

Once the drainage area has been developed, the drainage conditions are modeled with the use of the USDA NRCS Technical Release 55 (TR-55) titled *Urban Hydrology for Small Watersheds* and HydroCAD. The project site is developed for the 1 year, 10 year and 100-year storm event, referring to how often a proposed storm event is likely to occur. Table II depicts the estimated existing condition design storm peak runoff rates:

Table II
Existing Drainage Condition

Drainage Area	1 Year Storm	10 Year Storm	100 Year Storm
EDA-1	0.39 cfs	5.42 cfs	14.17 cfs

cfs: Cubic Feet per Second

The data in Table II will be used to compare with the proposed runoff rates. The proposed storm water management design must match or be less than the data above to comply with the New York State Department of Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Construction Activities (GP-0-20-001) requirements.

Developed Conditions

The proposed project will include the construction of a 9,100 square foot retail building, 35 parking stalls, an area for unloading deliveries, a dumpster area, as well as the earthwork required for this development.

The proposed drainage area is broken down into two separate drainage zones. The first drainage zone (PDA-1A) consists of the proposed building, the majority of the proposed parking area, the drive and some of the lawn area. The second drainage zone (PDA-1B) consists of the existing building, parking area, drive, lawn and wooded areas. This division allows us to calculate curve numbers for both drainage areas. Please see Table III below for this curve number data.

The time of concentration for PDA-1A starts at NYS Route 13 and flows north towards the proposed pavement. Once the flow reaches the proposed pavement, it will then travel towards one of four catchbasins. The water flow takes this path due to the proposed grading for the new development. Furthermore, the proposed grading allows multiple pavement areas to drain towards the four proposed catchbasins on the property.

Once the flow reaches one of these catchbasins, it will be captured and flow underground in a closed storm sewer system. This system consists of approximately 257 feet of 15 inch HDPE pipe. The runoff collected by the catchbasins will flow through this piping until it reaches the manhole for the proposed infiltration system. Here, the runoff will enter the pre-treatment segment of the infiltration system. The pre-treatment process allows material such as sediment, possible garbage, etc. to separate from the stormwater. Once the pre-treatment chamber is full, the stormwater will then flow into the next infiltration chamber. From here, the water will either infiltrate into the ground, or it will outlet into an overflow manhole. This overflow manhole will have a weir inside which will control the rate of the water discharge. The weir a metal plate that has multiple orifices at different elevations to control the outlet flow. Once the runoff passes through the weir, it will daylight and drain onto the surface, continuing towards the back of the property, i.e. the low point. Please see Table III below for the time of concentration data.

Table III
Developed Drainage Area Properties

Drainage Area	Total Area (Acres)	CN	Time of Conc. (hours)
PDA-1A	2.94	71	0.593
PDA-1B	1.06	95	0.082
Total Area	**4.00**		

The proposed drainage conditions were modeled with the use of the USDA NRCS Technical Release 55 (TR-55) titled *Urban Hydrology for Small Watersheds* and HydroCAD. The project site was modeled for the

1year, 10 year and 100-year design storms. Table IV depicts the estimated proposed conditions design storm peak runoff rates.

Table IV
Developed Drainage Condition

Drainage Area	1 Year Storm	10 Year Storm	100 Year Storm
PDA-1A	0.39 cfs	2.72 cfs	9.22 cfs
PDA-1B	2.79 cfs	5.76 cfs	6.53 cfs
Total	**3.18 cfs**	**8.48 cfs**	**15.75 cfs**

cfs: Cubic Feet per Second

As shown in the table above, the stormwater estimates for the project depict an increase in the water runoff for the developed site. As a result, stormwater best management practices (BMP) wil be incorporated in this development with the inatallation of the infiltration system previously described..

Mitigation Measures (BMP)

Mitigation of the increased stormwater run off will be easily handled by the underground infiltration chamber system designed for this property. As stated above, the building and parking lot will be collected by a series of catchbasin structures. Once collected, the runoff will be transferred to the isolation row of the proposed infiltration chamber system for pre-treatment. After pre-treatment process, the runoff will then outlet into the remaining chambers of the proposed system.

As designed, the infiltration chamber system for this development has the capacity to treat treat the total water quality volume (WQv) of 3,422 cubic feet and runoff reduction volume (RRv) of 1,358 cubic feet required by our calculations. Table V depicts the estimated mitigated conditions design storm peak runoff rates.

Table V
Stormwater Mitigation Summary

Drainage Area	1 Year Storm	10 Year Storm	100 Year Storm
PDA-1A	0.39 cfs	2.72 cfs	6.53 cfs
PDA-1B	0.00 cfs	0.15 cfs	7.46 cfs
Total	**0.39 cfs**	**2.87 cfs**	**13.99 cfs**
EDA-1 Total	**0.39 cfs**	**5.42 cfs**	**14.17 cfs**

cfs: Cubic Feet per Second

NYSDEC requirements state that post development conditions must remain the same or fall below the pre-developed conditions .As shown in Table V, the proposed infiltration chamber system will exceed the NYSDEC requirements for mitigation compared to the existing condition.

Lastly, as a best mamnagement practice, the proposed infiltration chamber system is designed with an overflow outlet. As seen in the table below, the max eleavation reached by a 100-Year storm event is 1067.40. With the bottom elevation of the chambers being 1063.70 and the top of the chambers being at an elevation of 1067.45, at an infiltration rate of 0.5 inches/hour, all runoff for a 100 year event can be stored within the infiltration chamber system. Table VI depicts the peak elevations and chamber discharge rate for each of the three required NYS DEC storm events.

Table VI
Infiltration Chamber System Summary

Drainage Storm	Stormwater Inflow	Chamber Discharge	Peak Elevation
1-Year	2.79 cfs	0.00 cfs	1064.80
10-Year	5.76 cfs	0.15 cfs	1066.75
100-Year	9.22 cfs	7.42 cfs	1067.40

cfs: Cubic Feet per Second

CONCLUSION

The proposed stormwater treatment system exceeds the NYSDEC requirements for a Construction SPDES permit and ensures that runoff for this development continues to flow away from NYS 13 and is treated, contained and released in a managed rate at the north end of the development.